

Serial No. 09/851,245

Reply To Office Action Of April 8, 2003

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listing of the claims in the application:

**LISTING OF THE CLAIMS:**

Claim 1 (Amended) A computer-assisted method for selecting and directing the isolation of one or more biomolecules present in a two-dimensional array, comprising:

a purification step, wherein a plurality of biomolecules of interest are substantially isolated from a first biological sample;

a first separation step, wherein said plurality of biomolecules are separated according to a first physical or chemical property to form a one-dimensional array of biomolecules;

a second separation step, wherein said one-dimensional array of biomolecules is separated according to a second physical or chemical property to form said two-dimensional array;

imaging said two-dimensional array ~~or a replica thereof~~ to generate a computer-readable output comprising, for each of a plurality of biomolecules detected in said two-dimensional array, a pair of x,y coordinates and a signal value;

processing said output in at least one computer to select one or more of said detected biomolecules in accordance with previously ordained or operator-specified criteria; and

~~optionally~~ generating machine-readable instructions that direct a robotic device to ~~remove~~ isolate at least one of said selected biomolecules from said two-dimensional array.

Claim 2 (Amended) The method according to claim 1, further comprising: ~~isolating~~ removing at least one of said selected biomolecules from said two-dimensional array by means of said robotic device in accordance with said machine-readable instructions.

Claim 3 (Original) The method according to claim 1, in which said biomolecules are

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proteins.

Claim 4 (Original) The method according to claim 1, in which said two-dimensional array is contained in a polyacrylamide gel.

Claim 5 (Original) The method according to claim 4, in which said biomolecules have been separated by isoelectric focusing, followed by electrophoresis in the presence of sodium dodecyl sulfate.

Claim 6 (canceled)

Claim 7 (amended) The method according to claim 6 4, in which said polyacrylamide gel is covalently bonded to said solid support.

Claim 8 - 27 (canceled)

Claim 28 (New) The method according to claim 1, wherein said purification step includes separating the biological sample based on biomolecule size.

Claim 29 (New) A computer-assisted method for selecting and directing the isolation of one or more proteins present in a two-dimensional array, comprising:

a purification step, wherein a plurality of proteins are isolated from a biological sample to produce a purified sample;

a first separation step following the purification step, wherein the plurality of proteins in the purified sample are separated according to a first physical or chemical property to form a one-dimensional array of proteins;

a second separation step, wherein the one-dimensional array of proteins is separated according to a second physical or chemical property to form the two-dimensional array;

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imaging the two-dimensional array or a replica thereof to generate a computer-readable output comprising, for each of a plurality of proteins detected in the two-dimensional array, a pair of x,y coordinates and a signal value;

processing the output in at least one computer to select one or more of the detected proteins in accordance with previously ordained or operator-specified criteria; and

generating machine-readable instructions that direct a robotic device to isolate at least one of the selected proteins from the two-dimensional array.

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Claim 30 (New) The method according to claim 29, wherein the purification step comprises the step of passing the biological sample through a size exclusion column.

Claim 31 (New) The method according to claim 29, in which the proteins in the two-dimensional array have been separated by isoelectric focusing, followed by electrophoresis in the presence of sodium dodecyl sulfate.

Claim 32 (New) The method according to claim 31, in which the polyacrylamide gel is initially covalently bonded to the solid support.

Claim 33 (New) The method according to claim 32, further comprising isolating at least one of the selected proteins from the two dimensional array by means of the robotic device in accordance with the machine-readable instructions.

Claim 34 (New) The method according to claim 33, wherein said polyacrylamide gel is separated from the solid support prior to isolation with the robotic device.

Claim 35 (New) The method according to claim 29, wherein said purification step includes column chromatography.